AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT	1. CONTRACT ID CODE	PAGE OF PAGES
	DACA41-02-R-0011	1 of 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO *(If applicable)*
3	8/20/2002		

6. ISSUED BY CODE	7. ADMINISTERED BY *(If other than item 6)* CODE
US Army Corps of Engineers, Kansas City District 760 Federal Building, 601 East 12th Street Kansas City, Missouri 64106-2896	

8. NAME AND ADDRESS OF CONTRACTOR *(No.,street, county, State and ZIP Code)*	(x)	9a. AMENDMENT OF SOLICITATION NO.
	X	DACA41-02-R-0011
		9B. DATED *(SEE ITEM 11)* 7/19/2002
		10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED *(SEE ITEM 13)*
CODE FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[x] The above number solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [X] is extended, [ ] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitaiton or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegraph which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFEI If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBER CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF:

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER ***(Specify type of modification and authority)***

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and retu copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Wastewater Treatment Plant
Fort Riley, Kansas

The solicitation is amended in accordance with the attached pages.
Due date is extended until 30 Aug 2002, 2:00 p.m.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changes, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNEI *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR _____ *(Signature of person authorized to sign)*	15C. DATE SIGNE	16B. UNITED STATES OF AMERICA BY _____ *(Signature of Contracting Officer)*	16C. DATE SIGNED

SOLICITATION DACA41-02-R-0011 is amended as follows:

1. SPECIFICATIONS.

a. **Supplemental Attachments.** Two of the supplemental attachment pages for section 15200 were inadvertently omitted from amendment 0002. Copies of the pages are enclosed.

b. **Narrative Changes**.

1. 1442.

a. Page 1, paragraph 13A: Change proposal due date to 30 Aug 02.

b. Page 3: Correct the definition for line item 0003, OPTION – HISTORIC DISTRICT PUMP STATION AND PIPELINES to state: "All work contained in series 36 and series 44 sheets."

2. Section 00800. Add the clause "Approved Equal" to section 00800. A copy of this clause is attached.

3. Section 02318, Blasting Controls.

a. Change paragraph 1.4.B to read as follows:

"B. Blasting shall be allowed only for the excavation of new structures located at the new plant site at Custer Hill. Additional information regarding bedrock rippability is provided in Table 1 at the end of this section."

b. Add Table 1 below to the end of the section.

Table 1 – Bedrock Rippability Characteristics

Seismic Line Number	Bedrock Formation	Bedrock Type	P-Wave Velocity (fps)[1]	Rippability[2] 1 – Good 2 – Marginal 3 – Poor to non-rippable	Depth to Top of Velocity Layer[3] (feet)
1	Ft. Riley	Limestone	9,880.6	2	7.5
2	Ft. Riley	Limestone	11,862.7	2	6.4
3	Ft. Riley	Limestone	12,187.5	3	12.3
4	Ft. Riley & Holmesville	Limestone & Shale	10,000.0	2	6.3
5	Towanda	Limestone	13,947.4	3	6.4
6	Towanda	Limestone	4,086.2	1	4.3
7	Towanda	Limestone & shale	6,859.8	2	4.0
8	Gage	Shale	8,318.0	1	5.1
9	Towanda	Limestone	5,000.0	1	6.6

1 – Represents the average maximum p-wave velocity of the forward and reverse seismic lines. (The seismic lines are shown on drawings G7 through G17.)
2 – Based on recommendations provided in "Caterpillar Performance Handbook, " edition 32. Rippability rating is based on the measured seismic velocity of the bedrock in addition to the use of the recommended minimum equipment size contained in the Handbook.
3 – Depth from the existing ground surface to the top of the fastest (hardest) velocity layer encountered. Represents an average depth of the forward and reverse seismic lines.

4. Section 02741, Hot-Mix Asphalt (HMA) for Roads.

a. Paragraph 3.5.1, Table 5. Change VMA, Percent (Average of 3 specimens) from "15 minimum" to "as specified for JMF."

b. Paragraph 3.11. Delete “2000 tons” in the fourth sentence.

5. Section 07416.

a. Paragraph 2.1.1, first sentence. Change “AZ55” to “AZ50.”

b. Paragraph 2.5. Change interior color finish sentence near the end to read as follows:

“The interior color finish shall consist of a 0.2 mil thick prime coat.”

6. Section 11312, Package Sewage Pump Station.

a. Paragraph 2.3.2: ADD the following sentence at the end of this paragraph:

“Check valves in the pump discharge piping shall be mounted horizontally.”

b. Paragraph 2.3.4: DELETE this paragraph and REPLACE it with the following:

“Use stainless steel anchor bolts, nuts, and washers for installation of equipment.”

c. Paragraph 2.4.2, subparagraph c:

1) CHANGE “1,600 gpm flow” to “2,000 gpm flow”.
2) CHANGE “169 feet head” to “156 feet head”.
3) CHANGE “74 minimum percent efficiency” to “73 minimum percent efficiency”.

d. Paragraph 2.4.3, subparagraph c:

1) CHANGE “1,600 gpm flow” to “2,000 gpm flow”.
2) CHANGE “169 feet head” to “156 feet head”.
3) CHANGE “74 minimum percent efficiency” to “73 minimum percent efficiency”.

e. Paragraph 2.4.3, subparagraph d: CHANGE “100 gpm flow” to “1,000 gpm flow”.

f. Paragraph 2.6.1: ADD the following sentence at the end of this paragraph:

“Provide a walk around landing platform part way down the entrance tube, in accordance with OSHA requirements.”

g. Paragraph 2.9, subparagraph c: DELETE this subparagraph in its entirety and REPLACE it with the following:
“c. All ductwork in the interior of the pump station shall be aluminum. Buried ductwork external to the pump station shall be steel, designed to handle the earth loads.”

h. Paragraph 2.10.4: DELETE the second sentence and REPLACE it with:

“The design head shall be equal to 250 feet.”

i. Paragraph 2.12.1: Following the 4th sentence, ADD the following:

”All structural plate and members shall be joined by continuous or seal welding.”

j. Paragraph 2.13.4.2: ADD the following instrument:

“Instrument Tag No.: PSH-2301, Description: Pressure Switch, Component Specification: P7, See Note 1.”

k. Paragraph 2.13.4.6: ADD the following subparagraph:

"d. A pressure switch system shall be provided to backup the communication link between the Main Post Intermediate Pump Station and the Main Post Pump Station and/or loss of the PLC in either pump station. The pressure switch system shall include relays for direct starting of the pumps, based on suction header pressure, without the need for PLC for 100% standby pump station control."

l. Paragraph 3.5: DELETE the first sentence and REPLACE it with:

"Services of a manufacturer's representative, who is a directly employed service engineer from the manufacturer's factory shall be provided. The representative shall be experienced in the installation, adjustment, and operation of the equipment specified."

7. Section 11376, Ultraviolet Disinfection Equipment.

a. Paragraph 1.9.b: DELETE paragraph in its entirety.

b. Paragraph 1.9.h: DELETE paragraph in its entirety.

c. Paragraph 2.2.3.1.d: DELETE first sentence in paragraph. ADD sentence,

"Contractor is required to wire each UV chamber including the terminal junction box."

d. Page 8, Paragraph 2.2.3.5: DELETE paragraphs b and c in their entirety. MODIFY paragraph d to read:

"The unit shall be a Hach Company model number DR/4000 Spectrophotometer, or equal, and shall be designed to be run from a 120V, 60-Hz AC supply."

e. Paragraph 3.2.2: MODIFY last sentence to read,

"Upon request of the Government, up to 3 times during the 1-year warranty period," ADD sentence at the end of the paragraph, "Representative shall be available for telephone consultation at any time during the 1-year warranty period."

f. Paragraph 3.4.3: ADD sentence,

"Manufacturer shall not be responsible for damage due to operator mishandling of equipment or parts."

g. Paragraph 3.4.3.c: DELETE paragraph in its entirety.

8. Section 11391, Continuous Loop Reactor Wastewater Treatment System. Paragraph 1.4.5.1. Delete sentence "No other System Suppliers will be acceptable."

9. Section 11590, Automatic Refrigerated Samplers.

a. Page 3, Article 2.1: REVISE Status Output paragraph to read:

"Each sampler shall be provided with one dry-contact type fail output for operational status monitoring (low main battery, low memory power, plugged intake program complete and purge failure)."

b. Page 4, Paragraph 2.2.c (2 places): REPLACE "Manning Environmental; Model 6901" with "Manning Environmental; Model YB38" for both outdoor and indoor locations.

10. Section 13405, Process Control, paragraph 3.5.1, subparagraph 5. Delete last sentence referring to section 01040 and replace with the following:

"Construction sequencing is outlined in section 01110, SUMMARY OF WORK."

11. Section 13405, Process Control, Supplement, Loop Specification. Delete Unit Process 05, UV Disinfection in its entirety and replace with the revised Unit Process 05, UV Disinfection material enclosed.

12. Section 13405, Process Control, Supplement, Control System I/O List. Delete AI-0501 on page 1.

13. Section 16263, Diesel-Generator Set Stationary 100-2500 KW, with Auxiliaries.

a. Paragraph 1.3.1, last sentence. Change end of sentence to read: "…. to meet requirements in Engine-Generator Parameter Schedule on the drawings."

b. Delete the supplement for section 16263 issued as part of amendment 0002.

2. PLANS.

a. **New Drawings.** Drawings G7 through G17 showing the locations of the borings are added. Drawing G18 is added showing three new borings at locations related to the transmission lines crossing roads, etc. Half-scale copies of the drawings are enclosed.

b. **Revised Drawings**. Drawings 2-C-2 and 2-C-3 are deleted and replaced with the correct drawings. Half-scale copies of the drawings are enclosed.

c. **Narrative Changes and Insert Drawings.** Narrative changes and insert drawings are outlined below.

1. Drawing 2-C-32. Detail B, Sludge Loading Structure, change dimension at top from "34'-0" x 40'-0" to "38'-0" x 40'-0".

2. Drawing 8-SM-4, Detail 2. Change top of grating elevation of lower landing on right side from 1243.50 to 1242.00.

3. Drawing 10-M-1. DELETE Transmittance Analyzer (AE-0501 and AIT-0501) and ½" SA pipe from 20" SE tee fitting to transmittance analyzer.

4. Drawing 10-M-2. DELETE Transmittance Analyzer (AE-0501 and AIT-0501), ½" SA pipe and ½" SA/D pipe to and from transmittance analyzer, NOTE 1, and DETAIL 1.

5. Drawing 22-S-3. Change all detail references 5521AA and 5521C to 5521.

6. Drawing 24-AS-3.

a. Change note at sludge loading structure at top left from "Refer to Civil Dwgs" to "Refer to Civil Dwgs (to include for dimensions)."

b. Door 24/103B is incorrectly shown on this sheet as a double pair of doors. The elevation on sheet 24-AS-1 and the door schedule correctly show the door as an overhead door.

7. Drawing 28-AS-1, West Elevation. Change single door shown to double door as shown on sheet 28-AS-2, Ferrous Chloride Bldg Foundation/Floor Plan and in the door schedule on sheet 48-D-3.

8. Drawing 28-AS-2, Ferrous Chloride Bldg Foundation/Floor Plan. Change door number to 20/101A to match the door schedule on sheet 48-D-3.

9. Drawing 36-C-1.

a. Change detail 2310 to 2315.

b. Change detail 3365 to 3356.

10. Drawing 38-I-8. DELETE Transmittance Analyzer AE-0501 and AIT-0501 and associated piping, valves, and calibration and cleaning piping and valves.

11. Drawing 38-I-27. ADD PSH-2301 as an additional device on PE-2301. Provide a discrete signal from PSH-2301 to CP-2302.

12. Drawing 40-E-9, MCC-H ONE-LINE:

a. ADD TX-H1 line side callout [P28].

b. ADD TX-H1 load side callout [2"C – 4#2, 1#8G].

13. Drawing 40-E-11, MCC-D1 ONE-LINE:

a. ADD 6-pole disconnect switch for EF-24-03.

b. CHANGE EF-24-04 single speed starter to two speed starter. ADD 6-pole disconnect.

14. Drawing 40-E-11, MCC-D2 ONE-LINE:

a. ADD 6-pole disconnect switch for EF-24-01.

b. ADD 3-pole disconnect switch for EF-24-02.

c. CHANGE TX-D2 from 15 KVA to 30 KVA.

15. Drawing 40-E-12:

a. CHANGE GBT ROOM FAN EF-24-05 designation to EF-24-03.

b. CHANGE BFP ROOM FAN EF-24-06 designation to EF-24-04.

16. Drawing 40-E-13, SOLIDS DEWATERING BLDG BLOWER ROOM EXHAUST FAN EF-24-01: ADD HI/LO/OFF/AUTO switch indication that switch is located at MCC.

17. Drawing 40-E-16, WWTP FIRE ALARM SYSTEM RISER DIAGRAM: CHANGE diamond with "S" symbol at Administration Building to diamond with "SD" symbol.

18. Drawing 40-E-18:

a. CHANGE LIGHTING PANEL MPC-CF2 to 12 circuit panel. MOVE circuit 14, 16, 18 to circuit 7, 9, 11.

b. CHANGE LIGHTING PANEL MPC-MI1 to 10 circuit panel. MOVE circuit 12 to circuit 1.

c. CHANGE LIGHTING PANEL MPC-BB1 to 10 circuit panel. MOVE circuit 12 to circuit 5.

19. Drawing 40-E-21:

a. On PLAN AT EL 1233.50, ADD callout to square with "S" symbol that this is the seal water solenoid valve.

b. On PLAN AT EL 1246.50, CHANGE "PLC" callout to "PLC/LCP-HW".

20. Drawing 40-E-23.

a. UPPER LEVEL PLAN: REPLACE with attached drawing 40-E-23A.

b. LOWER LEVEL PLAN: ADD callout [C7] to conduits between FV-0503-01 and FV-0503-02 to the J box, add callout [C15] to conduit from J box to LCP-UV.

21. Drawing 40-E-27, SCUM PUMP STATION PLAN: ADD three level switches inside wetwell. From each level switch, provide [C2] to LCP-0404. Callout conduit between LCP-0404 and TJB as [C9]. Callout conduit between disconnect switch and TJB as (2)[P3].

22. Drawing 40-E-28, POWER PLAN:

a. ADD [C2] circuit between each GUH and thermostat.

b. CHANGE GUH-18-1 on east side to GUH-18-2.

c. CHANGE callout on AC-18-2 to DDS to [C2].

d. ADD "TO PHOTOCELL" on [C2] callout from LC-1.

23. Drawing 40-E-30, AUXILIARY PLAN:

a. CHANGE diamond with "S" symbol to diamond with "SD" symbol.

b. ADD water flow alarm horn on outside of mechanical room.

24. Drawing 40-E-33:

a. CHANGE General Note 8 to "SEE DETAIL 1 ON SHEET 40-E-38 FOR WIRING DETAIL OF LCP-1004, SIMILAR."

b. CHANGE hand switches on BFP FEED PUMP ROOM – PART PLAN to motor rated switches. EF-22-01 switch shall provide ON-OFF control for EF-22-01. SF-22-01 switch shall provide ON-OFF control for SF-22-01 and open MD-22-01.

c. On PLAN, ADD callout to square with "S" symbol that this is the seal water solenoid valve.

25. Drawing 40-E-35: CHANGE LCP-1004 [C2] callout to [C4].

26. Drawing 40-E-36: CHANGE hand switches for exhaust fans EF-24-01, EF-24- 02, EF-24-03, and EF-24-04 to disconnect switches. Route circuit from MCC to disconnect switch to motor.

27. Drawing 40-E-45, EXISTING GENERATOR BUILDING: CHANGE LP-MP1 to separately mounted circuit breaker, transformer, and panelboard. Provide [P15] from circuit breaker to transformer, provide [1"C – 4#6, 1#8G] from transformer to panelboard.

28. Drawing 40-E-46, MAIN POST PUMP STATION MODIFIED ONE-LINE: DELETE dashed line around circuit breaker, transformer, and LP.

29. **Drawing 48-D-2**, Door Schedule.

a. Delete "I-LAM" under door glass column for doors 102A, Headworks building; door 113A, Control/Administration/Lab Building; and door 103B, Solids Dewatering building.

b. Change Door Type for Chemical Building doors 101A and 101B from type "F" to type "N".

3. Bidders are required to acknowledge receipt of this amendment on the Bid Form, in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause rejection of the bid.

4. Proposals will be received until 2:00 p.m., local time, 30 Aug 2002, in Room 760, Federal Building, 601 East 12th Street, Kansas City, Missouri 64106-2896.

Encls
1. Spec pgs as listed
2. Drawings as listed

New Section 00800 clause:

“APPROVED EQUAL

(a) The drawings and the TECHNICAL PROVISIONS of these specifications may, in some instances, refer to certain items of material, equipment, or article by trade name or otherwise indicate a specific manufacturer. References of this type shall not be construed as limiting competition, but shall be regarded as establishing a standard of quality. In this respect, the Contractor’s attention is directed to clauses 52.211-6 -- BRAND NAME OR EQUAL (AUG 1999) and 52.236-5 -- MATERIAL AND WORKMANSHIP (APR 1984).

(b) Such materials, equipment, or articles may be furnished from any of the listed manufacturers or, at the option of the Contractor, may be furnished from any other sources designated by the Contractor and approved by the Contracting Officer, subject to the conditions hereinafter stated.

(i) After award of the contract, the Contractor shall designate in writing only one source for each such material, equipment, or article from which it proposes to furnish the subject item(s). If the Contractor proposes to furnish materials, equipment, or articles from a source or sources not listed, the Contractor must so designate. If a proposed source for such materials, equipment, or articles is not approved for use by the Contracting Officer, the Contractor may not submit for approval other sources, but shall furnish the equipment, materials or articles from approved sources selected from the list contained herein at no additional cost to the Government.

(ii) The listing of an approved source of equipment, materials or articles is not to be construed as approval of all equipment, materials or articles from that source. The government reserves the right to reject equipment, materials or articles from sources that are determined not to be equal to the quality specified in the plans and technical provisions of the specifications herein. Items that are approved shall meet all the requirements of the plans and technical provisions of the specifications indicated. The listing of a source or manufacturer in the plans or technical provisions of the specifications herein is not to be construed by the Contractor to be a guarantee by the government of the availability or suitability of the equipment, materials or articles listed.

(end of clause)

Section 13405 Amended Material:

UNIT PROCESS 05, UV DISINFECTION

LOOP 0503, UV REACTOR ISOLATION VALVE

IPS Functions:

Field Devices and Connections:

Provide digital signal for remote status to PLC UV.
Provide digital signal for opened status to PLC UV.
Provide digital signal for closed status to PLC UV.
Receive digital signal for open control from PLC UV.
Receive digital signal for close control from PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide remote status to the HMI.
Provide opened status to the HMI.
Provide travel status to the HMI.
Provide closed status to the UV Reactor.
Provide closed status to the HMI.

Control mode:

Receive auto command from the HMI.
Provide logic to activate auto mode and deactivate manual mode upon auto command.
Receive manual command from the HMI.
Provide logic to deactivate auto mode and activate manual mode upon manual command.
Provide manual status to the HMI.
Provide auto status to the HMI.

Lead lag mode:

Receive lead command from the HMI.
Provide logic which makes this valve lead.
Provide logic which makes the other valve lag.
Provide lead status to the UV Reactor.
Provide lead status to the HMI.
Provide lag status to the UV Reactor.
Provide Lag status to the HMI.

Manual control mode:

Receive open command from the HMI.
Provide logic to energize open control upon open command.
Provide logic to deenergize open control upon opened status.
Receive close command from the HMI.
Provide logic to energize close control upon close command.
Provide logic to deenergize close control upon closed status.

Auto control mode:

Provide logic for open command for the lead valve if its UV Reactor has been on status for five minutes.
Provide logic to energize lead valve open control upon lead valve open command.
Provide logic to deenergize lead valve open control upon lead valve opened status.
Provide logic for close command for the lead valve if UV Disinfection Sump Pump is level alarm high.
Provide logic to energize lead valve close control upon lead valve close command.
Provide logic to deenergize lead valve close control upon lead valve closed status.
Receive final effluent flow high setpoint from the HMI.
Provide logic to start the lag valve's UV Reactor if Final Effluent Flow is at or above final effluent flow high setpoint.
Provide logic for open command for the lag valve if its UV Reactor has been on status for five minutes.
Provide logic to energize lag valve open control upon lag valve open command.
Provide logic to deenergize lag valve open control upon lag valve opened status.
Provide logic for close command for the lag valve if Final Effluent Flow is below final effluent flow high setpoint.
Provide logic for close command for the lag valve if UV Disinfection Sump Pump is level alarm high.
Provide logic to energize lag valve close control upon lag valve close command.
Provide logic to deenergize lag valve close control upon lag valve closed status.

Software Interlocks:

LOOP 0504, UV REACTOR FLOW.
LOOP 0505, UV REACTOR.
LOOP 0506, UV DISINFECTION SUMP PUMP.

PLC AB Application Software:

Monitor and Control:

None.

Software Interlocks:

None.

HMI Application Software:

HMI:

Display remote status.
Historically archive remote status.
Display opened status.
Historically archive opened status.
Display travel status.
Historically archive travel status.
Display closed status.
Historically archive closed status.

Control mode:

Provide auto command to PLC UV.
Provide manual command to PLC UV.
Display auto status.

Historically archive auto status.
Display manual status.
Historically archive manual status.

Lead lag mode:

Provide lead command to PLC UV.
Display lead status.
Historically archive lead status.
Display lag status.
Historically archive lag status.
Manual control mode
Provide open command to PLC UV.
Provide close command to PLC UV.
Auto control mode:
Provide final effluent flow high setpoint (3.7MGD) to PLC UV.
Display final effluent flow high setpoint.
Historically archive final effluent flow high setpoint.

Metasys:

None.

LOOP 0504, UV REACTOR FLOW

IPS Functions:

Field Devices and Connections:

Provide magnetic flowmeter to measure flow.
Indicate flow locally using required engineering units.
Provide analog signal proportional to flow range to PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide flows to the HMI.
Totalize flows.
Provide flow totalizers to the HMI.
Sum the flows for Final Effluent Flow.
Provide Final Effluent Flow to the HMI.
Provide Final Effluent Flow to UV Reactor Isolation Valves.
Provide Final Effluent Flow to Effluent Automatic Sampler.
Totalize final effluent flow.
Provide final effluent flow totalizer to the HMI.

Software Interlocks:

LOOP 0503, UV REACTOR ISOLATION VALVE.
LOOP 0508, EFFLUENT AUTOMATIC SAMPLER.

PLC AB Application Software:

Monitor and Control:

None.

Software Interlocks:

None.

HMI Application Software:

HMI:

Display flows.
Historically archive flows.
Trend flows.
Display flow totalizers.
Historically archive flow totalizers.
Display Final Effluent Flow.
Historically archive Final Effluent Flow.
Trend Final Effluent Flow.
Display final effluent flow totalizer.
Historically archive final effluent flow totalizer.

Metasys:

None.

LOOP 0505, UV REACTOR

IPS Functions:

Field Devices and Connections:

Provide digital signal for temperature OK status to PLC UV.
Provide digital signal for lamps OK status to PLC UV.
Provide digital signal for wiper fault alarm to PLC UV.
Provide digital signal for ground OK status to PLC UV.
Receive digital signal for run level 1 control from PLC UV.
Receive digital signal for run level 2 control from PLC UV.
Receive digital signal for run level 3 control from PLC UV.
Receive digital signal for immediate wipe control from PLC UV.
Provide analog signal proportional to UV intensity range to PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide logic to generate temperature alarm high from temperature OK status.
Provide temperature alarm high to the HMI.
Provide temperature alarm high to Common Alarm.
Provide logic to generate lamp alarm from lamps OK status.
Provide lamp alarm to the HMI.
Provide lamp alarm to Common Alarm.
Provide wiper fault alarm to the HMI.

Provide logic to generate ground fault alarm from ground OK status.
Provide ground fault alarm to the HMI.
Provide ground fault alarm to Common Alarm.
Provide run level 1 control to the HMI.
Provide run level 2 control to the HMI.
Provide run level 3 control to the HMI.
Provide immediate wipe control to the HMI.
Provide UV intensity to the HMI.
Provide UV intensity to PLC AB.
Receive UV intensity alarm low setpoint from the HMI.
Compare UV intensity with UV intensity alarm low setpoint to generate UV intensity alarm low.
Provide UV intensity alarm low to the HMI.
Provide UV intensity alarm low to Common Alarm.
Receive UV intensity alarm low-low setpoint from the HMI.
Compare UV intensity with UV intensity alarm low-low setpoint to generate UV intensity alarm low-low.
Provide UV intensity alarm low-low to the HMI.
Provide UV intensity alarm low-low to Common Alarm.
Provide UV intensity alarm low-low to PLC AB.

Control mode:

Receive auto command from the HMI.
Provide logic to activate auto mode and deactivate manual mode upon auto command.
Receive manual command from the HMI.
Provide logic to deactivate auto mode and activate manual mode upon manual command.
Provide manual status to the HMI.
Provide auto status to the HMI.
Manual control mode:
Receive run level 1 command from the HMI.
Provide logic to energize run level 1 control, deenergize run level 2 control and deenergize run level 3 control upon run level 1 command.
Receive run level 2 command from the HMI.
Provide logic to energize run level 1 control, energize run level 2 control and deenergize run level 3 control upon run level 2 command.
Receive run level 3 command from the HMI.
Provide logic to energize run level 1 control, energize run level 2 control and energize run level 3 control upon run level 3 command.
Receive stop command from the HMI.
Provide logic to deenergize run level 1 control, deenergize run level 2 control and deenergize run level 3 control upon stop command.
Provide logic which derives on status from run level 1 control.
Receive immedate wipe command from the HMI.
Provide logic to energize immediate wipe control upon immediate wipe command and then deenergize immediate wipe control after two seconds.

Auto control mode:

Provide logic to energize run level 1 control, energize run level 2 control and energize run level 3 control upon UV Reactor Isolation Valve in lead status.
Provide logic to deenergize run level 1 control, deenergize run level 2 control and deenergize run level 3 control upon UV Reactor Isolation Valve in lead and closed status.
Provide logic to energize run level 1 control, energize run level 2 control and energize run level 3 control upon UV Reactor Isolation Valve in lag status and Final Effluent Flow is at or above final effluent flow high setpoint.
Provide logic to deenergize run level 1 control, deenergize run level 2 control and deenergize run level 3 control upon UV Reactor Isolation Valve in lag and closed status.
Provide logic which derives on status from run level 1 and run level 2 and run level 3 control.

Provide on status to the UV Reactor Isolation Valve.
Provide on status to the HMI.
Accumulate run-time.
Provide run-time to the HMI.

Software Interlocks:

LOOP 0503, UV REACTOR ISOLATION VALVE.
LOOP 0507, UV AREA COMMON ALARM.

PLC AB Application Software:

Monitor and Control:

Provide UV intensity to Metasys.
Provide UV intensity alarm low-low to Metasys.

Software Interlocks:

None.

HMI Application Software:

HMI:

Display temperature alarm high with medium priority.
Historically archive temperature alarm high.
Display lamp alarm with medium priority.
Historically archive lamp alarm.
Display wiper fault alarm with low priority.
Historically archive wiper fault alarm.
Display ground fault alarm with medium priority.
Historically archive ground fault alarm.
Display run level 1 control.
Historically archive run level 1 control.
Display run level 2 control.
Historically archive run level 2 control.
Display run level 3 control.
Historically archive run level 3 control.
Display immediate wipe control.
Display UV intensity.
Historically archive UV intensity.
Trend UV intensity.
Provide UV intensity alarm low setpoint to PLC UV.
Display UV intensity alarm low setpoint.
Historically archive UV intensity alarm low setpoint.
Display UV intensity alarm low with medium priority.
Historically archive UV intensity alarm low.
Provide UV intensity alarm low-low setpoint to PLC UV.
Display UV intensity alarm low-low setpoint.
Historically archive UV intensity alarm low-low setpoint.
Display UV intensity alarm low-low with high priority.
Historically archive UV intensity alarm low-low.
Manual control mode
Provide run level 1 command to PLC UV.
Provide run level 2 command to PLC UV.
Provide run level 3 command to PLC UV.
Provide stop command to PLC UV.

Provide immediate wipe command to PLC UV.

Auto control mode:

None.
Display on status.
Historically archive on status.
Display run-time.

Metasys:

Display UV intensity.
Display UV intensity alarm low-low.

LOOP 0506, UV DISINFECTION SUMP PUMP

IPS Functions:

Field Devices and Connections:

Provide digital signal for level alarm high to PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide level alarm high to the HMI.
Provide level alarm high to Common Alarm.
Provide level alarm high to PLC AB.
Provide level alarm high to UV Reactor Isolation Valves.

Software Interlocks:

LOOP 0503, UV REACTOR ISOLATION VALVE.
LOOP 0507, UV AREA COMMON ALARM.

PLC AB Application Software:

Monitor and Control:

Provide level alarm high to Metasys.

Software Interlocks:

None.

HMI Application Software:

HMI:

Display level alarm high with high priority.
Historically archive level alarm high.

Metasys:

Display level alarm high.

LOOP 0507, UV AREA COMMON ALARM

IPS Functions:

Field Devices and Connections:

Provide the beacons.
Provide the horns.
Receive digital signal to energize the beacons from PLC UV.
Receive digital signal to energize the horns from PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide logic which energizes the beacons and horns if any of the following alarms become true:

UV Reactor temperature alarm high.
UV Reactor lamp alarm.
UV Reactor ground fault alarm.
UV Reactor intensity alarm low.
UV Reactor intensity alarm low-low.
UV Disinfection Sump Pump level alarm high.
Duress alarm.
Fire alarm.
Provide logic to deenergize the horns upon silence command from the HMI.
Provide logic to deenergize the beacons if none of the alarms are true and the horns have been silenced.

Software Interlocks:

LOOP 0505, UV REACTOR.
LOOP 0506, UV DISINFECTION SUMP PUMP.
LOOP 1908, PERSONNEL DURESS.
LOOP 1909, ADMINISTRATION BUILDING FIRE ALARM PANEL.

PLC AB Application Software:

Monitor and Control:

None.

Software Interlocks:

None.

HMI Application Software:

HMI:

Provide silence command to PLC UV.

Metasys:

None.

LOOP 0508, EFFLUENT AUTOMATIC SAMPLER

IPS Functions:

Field Devices and Connections:

Receive analog control signal proportional to Final Effluent Flow from PLC UV.
Provide digital signal for fail alarm to PLC UV.

Hard-Wired Interlocks:

None.

PLC UV Application Software:

Monitor and Control:

Provide analog control signal proportional to Final Effluent Flow.
Provide fail alarm to the HMI.

Software Interlocks:

LOOP 0504, UV REACTOR FLOW.

PLC AB Application Software:

Monitor and Control:

None.

Software Interlocks:

None.

HMI Application Software:

HMI:

Display fail alarm with low priority.
Historically archive fail alarm.

Metasys:

None.

Notes:
1. For buried service, pipe shall be inside 6-inch containment piping, as described in Drawing 20-M-1.
2. Piping in this service requires external insulation. See Section 15250.
3. Minimum pipe wall thickness shall be 3/8-inch.
4. Heat trace and insulate (with protective shell) all exposed, exterior piping in this service as specified.
5. F.S. = Federal Safety.
6. Per Uniform Plumbing Code.
7. OF = overflow; D = drain; V = vent
8. Process vent, overflow and drain piping shall be the same material as the associated process piping. This piping is identified by a two-symbol designation. The first symbol shall indicate the piping material to be used. For example, NA/V indicates a NA vent line constructed of CPVC material as indicated on the Pipe Schedule for NA.
9. Indicated as “Pressure, Type”. pressure shown in psig unless otherwise indicated. P = pneumatic; H = hydrostatic.
10. Test and inspect as required by local authorities.
11. Paint exterior piping.
12. All buried gas piping to be polyethylene except riser to exposed sections outside of buildings. Vertical section of piping at these locations shall be cathodically protected mill type steel as detailed on the Drawings.
13. All piping for this service shall be Schedule 80.
14. Culverts are RCP as indicated on the Drawings.
15. Storm drains are RCP as indicated on the Drawings.
16. CONTRACTOR has the option if two materials are indicated for the same service.
17. Concrete encase buried ALP piping
18. See Section 15190A GAS PIPING SYSTEMS
19. See Section 15400 PLUMBING, GENERAL PURPOSE
20. Piping as specified in Section 15200
21. Piping as specified in Section 02532
22. Temporary Plant Yard Piping Only
23. Permanent replacement to Temporary Plant Yard Piping

ABBREVIATIONS	
Piping Types	
Abbr.	Description
ARD	Acid Resistant Drain
CISP	Cast Iron Soil Pipe
CLDI	Cement Lined Ductile Iron
CPVC	Chlorinated Polyvinyl Chloride
PVC	Polyvinyl Chloride
PVC SDR 21	Polyvinyl Chloride per Section 02532
PVC SDR 25	Polyvinyl Chloride per Section 02532
PVC SDR 35	Polyvinyl Chloride per Section 02532
SST	Stainless Steel
STL	Carbon Steel
RCP	Reinforced Concrete Pipe per Section 02630A